EPA/ESD/R01-04/050
2004

EPA Superfund
Explanation of Significant Differences:

FORT DEVENS
EPA ID: MA7210025154
OU 09
FORT DEVENS, MA
03/08/2004

EXPLANATION OF SIGNIFICANT DIFFERENCES
AREA OF CONTAMINATION 57, DEVENS, MASSACHUSETTS

I. Introduction

A. Site Name and Location

Site Name: Area of Contamination 57, Devens, Massachusetts

Site Location: off Barnum Road, Ayer/Harvard, Massachusetts

B. Lead and Support Agencies

Lead Agency: US Environmental Protection Agency

Support Agency: Massachusetts Department of Environmental Protection

C. Legal Authority

Under Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA),[1] Section 300.435(c) of the National Contingency Plan (NCP),[2] and U.S. Environmental Protection Agency (EPA) guidance,[3] if EPA determines that differences in the remedial action significantly change but do not fundamentally alter the remedy selected in the Record of Decision (ROD) signed on September 28, 2001, with regard to scope, performance, or cost, EPA shall publish an explanation of the significant differences (ESD) between the remedial action being undertaken and the remedial action set forth in the ROD as well as the reasons such changes are being made.

D. Summary of Circumstances Necessitating this Explanation of Significant Differences

This ESD is necessary due to the circumstances listed below:

1. Increased volume and cost of contaminated soil requiring removal to attain cleanup levels at Area 2.
2. Inclusion of EPH as contaminant of concern for soils at Area 2, in the September 2001 AOC57 ROD, to monitor the presence of petroleum waste encountered during contaminated soil removal.
3. Inclusion of EPH and PCBs as contaminants of concern for Area 2 groundwater in the September 2001 AOC57 ROD for groundwater at Area 2.

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[1] 42 U.S.C. Section 9617(c).
[2] 40 C.F.R. Section 300.435(c).
[3] Office of Solid Waste and Emergency Response {OSWER} Directive 9355.3-02.

These circumstances were based on data obtained and observations made during the contaminated soil removal action initiated in January 2002 by Conti Environmental, Inc. (Conti) as contractor to the US Army Corps of Engineers New England District (USACE). Subsequent sections of this document provide further detailed discussions of the conditions leading up to these circumstances.

E. Availability of Documents

This ESD and supporting documentation shall become part of the Administrative Record for the Site. The ESD, supporting documentation for the ESD, and the Administrative Record are available to the public at the EPA Records Center and at the following additional locations.

US Environmental Protection Agency
Records Center
One Congress Street
Boston, MA 02114
(617) 918-1440

Hours: M-F 10:00 am - 1:00 pm
and 2:00 pm - 5:00 pm

BRAC Environmental Office
Building 666
30 Quebec Street
Devens, MA 01432

Hazen Memorial Library
3 Perimeter Road
Shirley, MA 01464

Harvard Public Library
Fairbanks Street
Harvard, MA 01461

Ayer Public Library
26 E. Main Street
Ayer, MA 01432

Lancaster Public Library
Main Street
Lancaster, MA 01523

II. Summary of Site History, Contamination Problems, and Selected Remedy

A. Site History and Contamination Problems

Site Chronology - Listed below are milestones relevant to the history of investigation and cleanup efforts at Devens AOC57 Area 2:

1992 – The drainage ditch at Area 2 was investigated as part of the Site Investigation for Groups 2 and 7 Historic Gas Stations. Fingerprint analysis of soil samples collected from the ditch area indicated soil contamination most likely derived from lubricating oil, or vehicle crankcase oil.

1994 – The Army performed a soil removal action at Area 2, in response to newly promulgated Massachusetts Contingency Plan (MCP) standards. The 1994 soil removal action was discontinued due to the soil contamination extending below the water table and well beyond the areal limits originally estimated. A total of 1,300 cubic yards of contaminated soil was removed during this 1994 removal action.

1995 – 1998 – The Army conducted site Remedial Investigations at AOC57 Areas 2 and 3.

2000 – The Army performed additional soil and groundwater investigations, and completed a Feasibility Study for selection of final remedies at AOC57 Areas 2 and 3.

2001 – A Record of Decision was signed on September 28, 2001 for AOC57 Areas 2 and 3.

Record of Decision – The September 28, 2001 ROD for Area of Contamination 57 presented the Army's selected remedial action for soil and groundwater contamination at Areas 1, 2 and 3. The selected remedy for Area 1 was "No Further Action". The selected remedy for Area 2 was "Excavation (for possible future use) and Institutional Controls". The selected remedy for Area 3 was "Excavation (to Accelerate Groundwater Cleanup) and Institutional Controls". Information on the soil volume originally proposed for excavation and cost for remedy implementation in the ROD is provided in Section IV below.

History of Petroleum Waste Seepage - The petroleum waste contamination at AOC 57 Area 2 reportedly resulted from spills or releases of various oils or fuel materials from historic motor pool vehicle service operations. The June 2000 Remedial Investigation (RI) report for AOC 57 and the Feasibility Study (FS) (each prepared by Harding Lawson Associates) document historic observations and measurements related to the presence of subsurface petroleum waste at AOC 57 Area 2. The reports describe observations made during a previous removal action, performed in August-September 1994, of an oily sheen on groundwater, and black oily soil at the base of the existing slope in Area 2. A sample of the groundwater taken from the sheen in an open trench showed elevated Total Petroleum Hydrocarbon (TPH) concentrations of 754,000 mg/l, and Polychlorinated BiPhenyls (PCBs) (140 mg/l). A fingerprint analysis indicated that the petroleum waste was most likely a mixture of kerosene and lubricating oil.

Plans for further investigation were subsequently developed and executed during the RI, forming the basis for the planned remedial action as selected in the ROD. The USACE issued a task order to Conti in November of 2001 to perform the source remedial action.

January 2002 Contaminated Soil Removal - The remediation scope addressed removing contaminated soil to achieve cleanup levels for lead and PCB Aroclor-1260 in soil at Area 2, (600 mg/kg and 3.5 mg/kg, respectively) which were established in the ROD for AOC 57. The remedial contractor mobilized for the soil removal work on January 23, 2002, began excavation

on January 29 within initial excavation limits staked based on the selected remedy in the ROD for Area 2 and 3. Soil samples collected from Area 3 confirmed that ROD cleanup levels had been attained.

During the soil removal work at Area 2, oil sheening/globules were frequently observed on the groundwater surface in the open excavation. At the direction of the Devens Base Closure Team (BCT), the excavation was expanded beyond the initial excavation limits to remove visible petroleum-contaminated soils. The remedial contractor deployed absorbent materials to soak up the petroleum waste sheen/globules, and stored the materials in 55-gallon drums for proper disposal. On February 13, 2002, the remedial contractor completed removal of visibly stained soils, having obtained a full set of representative post-excavation samples from the excavation sides and bottom per the work plan, submitted for chemical analysis for lead and PCB Aroclor-1260. The confirmatory samples for the final excavation limits exhibited concentrations of these constituents below the ROD cleanup levels. The remedial contractor removed a total of 2,197 tons of contaminated soils from AOC57 Areas 2 and 3. Approximately 2,000 tons (1,300 cubic yards) were removed from Area 2 and the remainder from Area 3. All contaminated soils were transported off site for treatment/recycling in a thermal desorption process at Environmental Soils Management, Inc. (ESMI) in Loudon, NH.

The last area excavated in Area 2 was at a location on the upgradient side of the initial excavation limits and within the footprint of the previous 1994 removal area, but at a greater depth than the 1994 removal. Up to the endpoint of the soil removal work, petroleum waste sheens and globules persisted on the water surface within the excavation. Due to these persistent petroleum waste sheens and globules on groundwater in this area, a small portion of the excavation was left open to observe and absorb/remove further sheens or globules on the groundwater surface. During backfilling, the remedial contractor also installed four 12-inch diameter corrugated metal pipe sumps (CMP sumps) with vertical slots at locations surrounding this open excavation area to aid in observing the petroleum waste sheen on the groundwater surface. Due to the persistent petroleum waste seepage, the excavation was left open, and additional remediation work was planned and implemented.

On February 20, 2003, at the direction of USACE, the remedial contractor obtained a sample of the floating petroleum waste sheen in the open excavation. The waste sample was analyzed for TPH and PCBs. The analytical results were consistent with previous results during the 1994 removal action (350,000 mg/kg TPH, and 103 mg/kg total PCBs, fingerprint description as mixture of #2 fuel oil and motor oil). Note that the results were reported in units of mg/kg since the laboratory treats waste samples in a manner similar to soil samples as opposed to aqueous samples.

Petroleum Waste Recovery February 2002 – August 2003 - Following completion of the excavation work on February 13, 2002, the remedial contractor deployed and removed absorbent materials on to mitigate the petroleum waste sheen and globules in the open excavation. As of August 2003, the open excavation was approximately 30 feet in diameter, and averaged 3 to 4 feet in depth, with approximately one to two feet of standing groundwater. Due to the persistence of the petroleum waste sheen at the open excavation, at the authorization of USACE, the remedial contractor installed and operated a belt-skimmer based product recovery system at Area 2 during September – November 2002, decommissioned the system for the winter, and then

installed and operated the system from May 2003 through August 2003. Throughout 2003, the open excavation water surface exhibited only isolated oil globules, and therefore the product recovery system was deployed in the two most downgradient CMP sumps. The product recovery system was alternately operated in each of the two most downgradient CMP sumps in 2003, with manual bailing performed on the sump without the skimmer. The system, in combination with manual bailing, successfully removed a total of approximately 80 gallons of petroleum waste/water mixture from operating on the open excavation water surface in 2002, and CMP sumps in 2003.

September 2002 Supplemental Soil Sampling – Based on BCT planning, the USACE executed supplemental soil sampling at Area 2 in September of 2002. The purpose of this sampling was to evaluate the source and delineate the extent of petroleum waste-contaminated soil at AOC57 Area 2. The data would be used to support further decision making on additional remediation work required at Area 2 and assist in locating monitoring wells for long term monitoring. The remedial contractor conducted this work under a Draft Supplemental Soil Sampling Plan, dated August 2002, and reported the results in a Draft Technical Memorandum dated October 15, 2002. The investigation delineated zones of visibly impacted subsurface soil remaining at the site, immediately surrounding and upgradient of the existing open excavation, and documented that a portion of these soils exceed ROD cleanup levels.

Monitoring Well Installation and Soil Sampling - Between December 2002, and March 2003, the remedial contractor and team subcontractor Nobis completed additional investigation field work at AOC57 Area 2, including drilling twelve (12) soil borings and installing six (6) groundwater monitoring wells. Drilling subcontractor TDS mobilized a Bombardier all-terrain vehicle (ATV) drill rig equipped with 4.25-inch hollow-stem augers and 2-inch split spoon samplers, to complete the installations. The remedial contractor conducted this work according to the Work Plan Amendment for Monitoring Well Installation and Soil Sampling at Area 2, dated January 2003. Results are reported in a draft Technical Memorandum entitled "Summary of Soil Sampling and Testing Data, and Recommendations for Further Removal Action", dated April 14, 2003.

Work Plan Amendment for Additional Contaminated Soil Removal - The monitoring well installation and soil sampling further reduced uncertainties regarding the extent of subsurface soils exceeding ROD cleanup levels at the site, and led to identified target areas for further removal. A contaminated layer of soils, approximately 2 to 5 feet in thickness over the identified areas as evidenced by soil boring logs and analytical testing data, was targeted for further removal. The remedial contractor prepared a Work Plan Amendment for this additional removal work in May 2003, and the work was scheduled for the dry period of the year, in September 2003, when groundwater is at a low point. The Work Plan Amendment included modifications to address changes in the remedial approach resulting from this ESD.

September 2003 Final Soil Removal at Area 2 - The USACE remedial contractor mobilized in September 2003 to execute the final removal of contaminated soil at Area 2, followed by completion of site restoration. Excavation work began at a small area around newly installed well 57M-03-06X. Confirmatory samples taken from this excavation area around well 57M-03-06X met the cleanup goals, and the area was subsequently backfilled.

Excavation work continued at the slope area at Area 2, and progressed in a southerly direction. This direction of excavation allowed management of the groundwater infiltrating into the excavation bottom, through pumping to storage tanks, as the work progressed. Confirmatory samples were obtained to meet or exceed the required frequencies in the work plan amendment, which in many cases supercede results of confirmatory samples taken at some sidewalls and bottom locations during the 2002 removal work. All of the confirmatory samples obtained during the progress of the work met the final soil cleanup levels. An interceptor/monitoring trench was installed, at a location in Area 2 between the 2003 soil excavation area and the wetlands, to monitor any residual floating petroleum waste/sheens following the completion of the source removal work.

A total of 2,361 tons (approximately 1,500 cubic yards) of contaminated soils were removed in 2003 for recycling at the ESMI facility in Loudon, NH, and a total of approximately 96,000 gallons of contaminated groundwater were pumped, stored, and discharged to the Devens Sewer system under a temporary discharge permit. The 2003 soil removal successfully achieved the revised cleanup levels for soil at AOC57 Area 2. De-minimus remaining contamination (as evidenced by sheening on infiltrating groundwater observed at the completion of excavation in 2003 at Area 2), is consistent with, and will be addressed by, the planned remediation approach for groundwater contamination in the Long Term Monitoring Plan.

B. Summary of the Selected Remedy

Key components of the Selected Remedy for Area 2, Excavation (for Possible Future Use) and Institutional Controls, are summarized below:

- Soil Excavation and Treatment/Disposal at an off-site treatment, storage, or disposal facility;
- Wetlands Protection;
- Institutional Controls (Existing zoning that prohibits residential use of Area 2 property and proposed deed restrictions that prohibit potable use of Area 2 groundwater and residential use of flood plain property);
- Environmental Monitoring (long term groundwater and surface water monitoring)
- Insitutional Control Inspections; and,
- Five-year Site Reviews.

Key components of the Selected Remedy for Area 3, Excavation (to Accelerate Groundwater Cleanup) and Institutional Controls are summarized below.

- Soil Excavation and Treatment/Disposal at an off-site treatment, storage, or disposal facility;
- Wetlands Protection;
- Institutional Controls (Existing zoning that prohibits residential use of Area 3 property and proposed deed restrictions that prohibit potable use of Area 3 groundwater and residential use of flood plain property);
- Environmental Monitoring (long term groundwater and surface water monitoring);

- Insitutional Control Inspections; and,
- Five-year Site Reviews.

III. Basis for the Document

Data obtained, and observations made during the January 2002 soil removal work, during the subsequent investigations for further soil delineation, and petroleum waste recovery efforts from 2002 through 2003, resulted in discovery of site conditions at AOC57 Area 2 which are different than conditions upon which the September 2001 ROD were based. These differences include an increased volume of petroleum waste-contaminated soil. The ROD addressed petroleum contamination by assuming that if the cleanup level for PCBs was attained in soil, the petroleum contamination would be successfully mitigated at the same time. However, confirmatory sampling results from the January 2002 soil removal and subsequent field observations showed that observable petroleum waste contamination persisted in areas where confirmatory samples indicated that the ROD cleanup level for PCBs had been attained.

These differences between the ROD assumptions and conditions encountered during the initial remediation work in January 2002 are being addressed using the same remedial technology/approach as specified in the ROD (Soil Removal). However cleanup goals (in the form of additional contaminants of concern [COC] and appropriate cleanup concentrations related to the increased quantity of petroleum-impacted media) should be formally adopted for AOC57 Area 2 so that a proper cleanup endpoint can be achieved and documented.

In response to results of the January 2002 removal action, the persistent petroleum waste seepage at AOC57 Area 2, and supplemental soil sampling/delineation work at this site through January 2003, EPA issued a letter on January 10, 2003 to the U.S. Army Devens Base Re-Alignment and Closure (BRAC) Environmental Coordinator, to request that an ESD be prepared to add Extractable Petroleum Hydrocarbons (EPH) as a contaminant of concern for site soils and groundwater. The EPA further requested (in accordance with a December 13, 2002 memorandum issued by John Regan with the Massachusetts Department of Environmental Protection [MADEP]) that the S3/GW-1 cleanup goal of 200 ppm for C11-C22 aromatics in soils should be the specified EPH cleanup goal at Area 2.

On August 29, 2003, the BRAC Environmental Coordinator decided to proceed with preparation of an Explanation of Significant Differences (ESD) to address the increased volume of soil requiring remediation at AOC57 Area 2, and the addition of EPH as a contaminant of concern. In addition, the provisions of the ESD were incorporated in the Work Plan Amendment for Additional Soil Removal, which addressed work planned for September-October 2003.

In February 2004, EPA requested the addition of PCBs as contaminants of concern in groundwater at Area 2. The additional analytes (EPH C11-C22 aromatics, and PCBs) for Area 2 groundwater samples will be incorporated into the Long Term Monitoring Plan for AOC57.

IV. Description of Significant Differences

The significant differences between the remedy as presented in the ROD and the action now being proposed are described below:

1. Increased volume and cost of contaminated soil requiring removal to attain cleanup levels at Area 2;
2. Inclusion of EPH as contaminant of concern for soils at Area 2, in the September 2001 AOC57 ROD, to monitor the presence of petroleum waste encountered during contaminated soil removal; and,
3. Inclusion of EPH and PCBs as contaminants of concern for Area 2 groundwater in the September 2001 AOC57 ROD.

Original Remedy

The technology selected for soil contamination in the Original Remedy was Soil Excavation and Treatment/Disposal at an off-site treatment, storage, or disposal facility. The estimated volume of soil to be removed from AOC57 Area 2 in the original remedy was 640 cubic yards.

Cleanup Levels in the Original Remedy were as follows:

Area 2 Soil COC	**Cleanup Level in Soil**
PCB Aroclor-1260	3.5 mg/kg dry weight
Lead	600 mg/kg dry weight

Area 2 Groundwater COC	**Cleanup Level in Groundwater**
Arsenic	50 ug/l
Cadmium	5 ug/l
1,4-Dichlorobenzene	5 ug/l
Tetrachloroethene	5 ug/l

Modified Remedy

The estimated volume of soils removed in the Modified Remedy is 2,920 cubic yards, which includes an estimated 1,420 cubic yards excavated during the January 2002 removal action, and an estimated 1,500 cubic yards excavated in 2003 to address the remaining soil contamination.

Cleanup levels in the Modified Remedy are as follows:

Area 2 Soil COC	**Cleanup Level in Soil**
PCB Aroclor-1260	3.5 mg/kg dry weight
Lead	600 mg/kg dry weight
EPH C11-C22 Aromatics	200 mg/kg dry weight (MADEP method)

Area 2 Groundwater COC	Cleanup Level in Groundwater
Arsenic	50 ug/l
Cadmium	5 ug/l
1,4-Dichlorobenzene	5 ug/l
Tetrachloroethene	5 ug/l
EPH C11-C22 Aromatics	200 ug/l
PCBs (total of all aroclors)	0.5 ug/l

The added cleanup levels for EPH C11-C22 Aromatics in soil and groundwater are based on current MCP Method 1 risk assessment standards for soil type "S-1" (surface accessible soils consistent with unrestricted use), and groundwater category "GW-1" (consistent with potential future use for drinking water supply). The added cleanup level for PCBs in groundwater is based on the current EPA Maximum Contaminant Level (MCL) for drinking water.

Summary of Costs

The original remedy for soils remediation at AOC 57 Areas 2 and 3 had an estimated total capital construction cost of $ 429,344, including $ 80,699 for Area 3, and $ 348,645 for Area 2.

The final remedy for soils remediation at Areas 2 and 3 combined has a projected at-completion total cost of $ 1,074,213. This cost includes costs of the soil removal work, closeout reports, and also some groundwater well installations, which may become part of the long-term monitoring network. The increase in costs can be attributed to the increased total volume of soil remediated, related additional delineation work, and the need for increased recovery of floating petroleum waste.

V. Supporting Agency Comments

The EPA and MADEP have determined that the ESD and proposed changes are acceptable.

VI. Statutory Determination

Considering the new information that has been developed and the changes that have been made to the selected remedy, the Army, EPA and MADEP believe that the remedy remains protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to this remedial action, and is cost-effective. In addition, the revised remedy utilizes a permanent solution to the maximum extent practicable for this Site. The modified remedy satisfies requirements set forth in CERCLA §121.

VII. Public Participation Activities

Although a formal public comment period is not required for this ESD, the Army, pursuant to CERCLA Section 117(c), shall publish a notice of availability and a brief description of the ESD in a local newspaper of general circulation, and make the ESD available to the public by placing it in the administrative record file and information repositories listed in Section I.E.

DEPARTMENT OF THE ARMY
BASE REALIGNMENT AND CLOSURE
ATLANTA FIELD OFFICE
1347 THORNE AVENUE SW, BLDG243
FORT MCPHERSON, GEORGIA 30330-1062

MARCH 8, 2004

Reply to the order of
BRAC Environmental Office
DAIM-BO-A-DV
30 Quebec Street, Box 100
Devens, MA 01432

Ms. Carol Keating, Remedial Project Manager
U.S. Environmental Protection Agency
1 Congress Street, Suite 1100 (Mailcode HBT)
Boston, MA 02114-2023

Dear Ms.Keating:

Enclosed for your records, pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments Reauthorization Act of 1986, is the following document:

Final Version
Explanation of Significant Differences - ESD
Area of Contamination (AOC) 57
Devens, Massachusetts

If you have any questions regarding this matter, you may contact me at (978) 796- 2205.

Sincerely,

Benjamin F. Goff
BRAC Environmental Coordinator

Enclosures